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Images in Cardiology

Valve-in-Valve TAVR for Large Degenerated Bioprosthetic Valves: The Added Value of XL-32—mm MyVal Octacor

Mariano Pellicano, MD, PhD, MSc, Carolina Montonati, MD, Dario Pellegrini, MD,

Daniele Briguglia, MD, Francesco Giannini, MD, Calin Coman, MD,

Valentina D'Alessandro, MD, Giuseppe De Blasio, MD, Giulio Guagliumi, MD,

Maurizio Tespili, MD, and Alfonso Ielasi, MD

U.O. Cardiologia Ospedaliera, IRCCS Ospedale Galeazzi-Sant'Ambrogio, Milan, Italy

An 84-year-old man with previous surgical aortic valve replacement (SAVR) with Freedom SOLO n.27-mm stentless bioprosthesis (supra-annular implant diameter 29 mm) (Sorin Group, Milan, Italy) was referred for valve-in-valve transcatheter aortic valve replacement (ViV-TAVR) because of bioprosthetic valve degeneration 12 years after index SAVR. Preprocedural transesophageal echocardiogram revealed a dilated left ventricle with severely reduced left ventricular ejection fraction (LVEF) (30%) and severe aortic regurgitation caused by bioprosthetic leaflets degeneration (Fig. 1, A and B). Preprocedural computed tomography (CT) imaging showed large degenerated stentless bioprosthesis (perimeter-derived diameter: 30.4 mm) with a significant mismatch between intraprosthetic and left ventricle outflow tract (LVOT) areas (713.6 mm² vs 999.1 m² LVOT dominant; Fig. 1, C and D); low left main coronary artery (LMCA) takeoff (6.4 mm; Fig. 1E); virtual valve-to-coronary (VTC) distance of 7.8 mm for LMCA and 4.3 mm for right coronary artery (RCA) (Fig. 1, I and J) and a virtual valve-to-aorta (VTA) distance of 2.1 mm (Fig. 1K). A transfermoral ViV-TAVR with XL-32 mm MyVal Octacor (Meril, London, UK) was planned, with LMCA protection for mini-chimney stenting (Fig. 2A). Given the severe regurgitation in an "enlarged" stentless bioprosthesis and the LVOT dominant area, the XL-32-mm MyVal Octacor (12.6% oversize at nominal volume) was prepared by adding 2 cc of solution in the balloon, aiming to reach a higher oversize (theoretically suggested at approximately 20% for treatment of aortic regurgitation [AR]). Under rapid pacing a successful direct ViV implantation was performed (Fig. 2, B-D; Video 1 End, view video online),

E-mail: marianopellicano@libero.it See page 1 for disclosure information.

44 45 followed by 4.0 \times 23- mm drug-eluting stent (DES) deployment within the proximal part of the LMCA, extended above the displaced leaflet tissue (Fig. 2, E-H). The final hemodynamic assessment revealed no gradients or significant residual regurgitation (Fig. 2, I and J; Video 2 Tin, view video online). Predischarge echocardiogram showed a mild posterolateral paravalvular leak and the postintervention CT scan confirmed a proper ViV implantation depth and ratio between the upper frames of the MyVal Octacor and the proximal part of the DES (Fig. 2, K-M).

Because the maximum limit of the native annulus area and perimeter-derived diameter for other balloon-expandable valves (BEVs) are 683 mm² and 29.5 mm, respectively, XL-32-mm MyVal Octacor, designed to cover annulus areas up to 840 mm², is the only transcatheter heart valve (THV) fitting large degenerated bioprostheses, without the need for extreme oversizing.^{1,2} In this perspective, the XL-32-mm MyVal Octacor might be consider a safe and promising option for degenerated "enlarged" bioprosthetic valves highlighting-even in the ViV-TAVR setting-the concept of patient-specific device selection.³

Ethics Statement

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Patient Consent The authors confirm that a patient consent form has been obtained for this article.

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Disclosures

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Corresponding author: Dr Mariano Pellicano, U.O. Cardiologia Ospedaliera, IRCCS Ospedale Galeazzi-Sant'Ambrogio, Via C. Belgioioso 173, 20157 Milan, Italy. Tel.: +39 02-8350676. Q3

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intraprosthetic area; (D) LVOT area; (E and H) LMCA take-off of 6.4 mm (red arrows: bioprosthetic leaflet toward the LMCA ostium); (F) and (G) Freedom SOLO (Sorin Group, Milan, Italy) design with 2 bovine pericardial sheets for supra-annular subcoronary implantation using a single suture line; (I) VTC-LCA: 7.8 mm; (J) VTC-RCA: 4.3 mm; (K) VTA: 2.1 mm; (L) VTSTJ: 2.1 mm. LVOT, left ventricular outflow tract; LMCA, left main coronary artery; ViV-TAVR, valve-in-valve transcatheter aortic valve replacement; VTA, virtual valve-to-aorta distance; VTC, virtual valve-to-coronary distance; VTSTJ, virtual valve-to-sinus of Valsalva distance.

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Figure 2. ViV-TAVR intervention. (A) Mini-chimney stenting preparation: LMCA engagement with EBU 3.5 6-Fr guiding catheter; 2 workhorse guidewires placed in the left anterior descending artery and left circumflex artery respectively; 4.0×23 mm DES positioned in the LMCA before ViV-TAVR. (B-D) XL-32-mm MyVal Octacor (Meril, London, UK) positioning and implantation. (E) Retraction and deployment of the 4.0 × 23-mm DES within the proximal part of the LMCA. (F) Postdilation and ostial "flairing" with 5.0×12 mm NC balloon at 24 atm. (G) Left coronary angiography Q5 control. (H) Final result. (I) Pre-ViV-TAVR: ADP: ~ 44 mm Hg and LVEDP: ~ 30 mm Hg. (J) Post-ViV-TAVR: ADP: ~ 80 mm Hg and LVEDP: ~ 12 mm Hg. (K and L) Proper ratio between upper frames of XL-32-mm MyVal Octacor and the proximal part of DES, flairing in the aorta. (M) Proper im-Q6 plantation depth. ADP, aortic diastolic pressure; BMW, balance middle weight; DES, drug-eluting stent; EBU, extra backup; LMCA, left main coronary artery; LVEDP, left ventricle end-diastolic pressure; NC, noncompliant; ViV-TAVR, valve-in-valve transcatheter aortic valve replacement.

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Supplementary Material

To access the supplementary material accompanying this article, visit the online version of the Canadian Journal of Cardiology at www.onlinecjc.ca and at https://doi.org/10. 1016/j.cjca.2024.09.009.

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